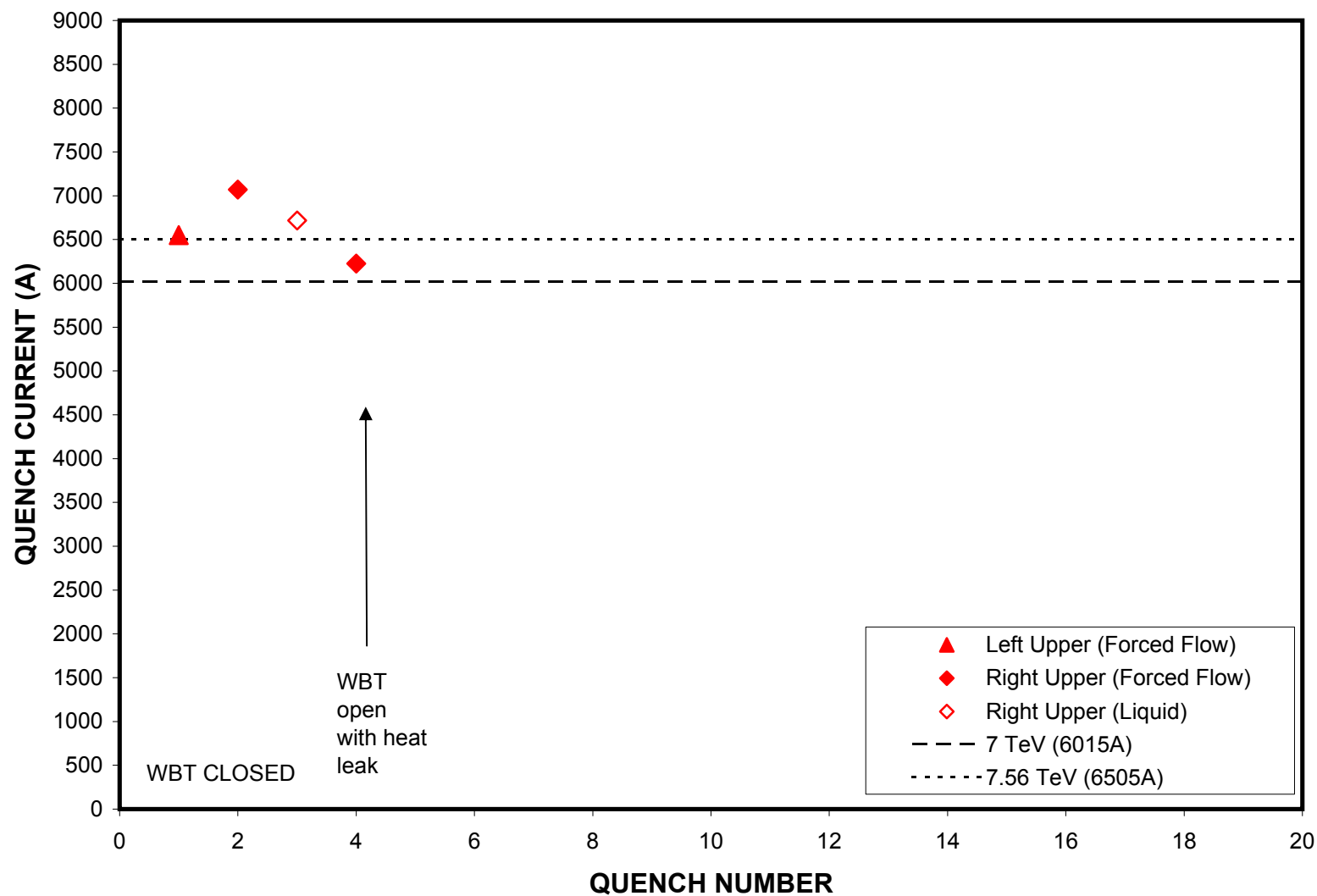


D4L102 QUENCH TESTS



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D4L102 QUENCH SUMMARY

Magcool Bay C

QUENCH #	RUN #	CURRENT (A)	T1 (K)	T3 (K)	START (ms)	MIITS	COIL	COMMENTS
T = 4.5K (nom)								
Warm bore tubes installed, sealed, and under vacuum								
Forced flow cooling @ 12atm								
1	14	6549	4.572	5.118	-44	10.0	upper left	
2	15	7071	4.654	5.284	-14	9.1	upper right	
Switched to liquid helium bath cooling @ 1.4atm								
Warm bore tubes sealed and under vacuum								
3	16	6717	4.609	4.584	-14	7.5	upper right	(i)
Switched back to forced flow cooling @ 12atm								
Warm bore tubes open								
4	18	6226	4.773	5.333	-14	8.0	upper right	(j)

Magnetic field measurements to 6400A with no quenches

Notes:

- Ramp rate for quenches was 20A/s. (Except for quench 4, see (j) below)
- Energy extraction used: 35mohms for all quenches.
- The temperature T1 is a diode sensor located in the helium return line tube which contains the superconducting bus; T3 is in the lower lead interconnect pot. Both have associated redundant sensors.
- There were no auxiliary voltage taps in the magnet coils.
- Data acquisition sampling rate was 1kHz for all quenches.
- Strip heaters were fired at 475V (nom) and 96A (nom), with 1ms delay.
- For all quenches, the voltage difference quench detector threshold voltage was set at 0.6V.
- Some voltage spikes seen in baseline prior to, but not at quench start, in all quenches.
- For quench 3, the left upper coil also quenched, at +49ms (63ms after the right upper). This would explain the low miits generated here.
- Quench 4 occurred during a ramp to 6400A at 10A/s for the first AC cycle before the start of field measurements. We have strong evidence that this quench, with the warm bore tubes open and at room temperature, was caused by residual heat from the bore tube. The bore tube of the coil that quenched (right aperture) had been shown earlier in the day to have an inadequate insulating vacuum. The valve connecting from the vacuum pump had been closed

and the temperature inside the bore tube was abnormally cold. This had been corrected hours before start of the ramp and all parameters looked nominal by ramp start. But there must still have been residual heat left to cause the quench. By the time the system recovered after the quench, the system had returned to nominal temperatures and there were no more quenches during repeated ramps to 6400A during field measurements. In addition, an inspection of all the signals from the quench had shown no electrical anomalies. It was therefore decided that further quench tests were unnecessary.